Content archived on 2024-06-18

MEMS-Based Electric Micropropulsion for Small Spacecraft to Enable Robotic Space Exploration and Space Science

Fact Sheet

Project Information

MICROTHRUST

Grant agreement ID: 263035

Project website

Project closed

Start date
1 December 2010

End date
30 November 2013

Funded under
Specific Programme "Cooperation": Space

Total cost
€ 2 842 535,13

EU contribution
€ 1 992 906,50

Coordinated by
ECOLE POLYTECHNIQUE FEDERALE DE LAUSANNE
🇨🇭 Switzerland

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NO. 20, MARCH 2013

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NO. 32, MAY 2014

Objective

Our MicroThrust proposal addresses the FP7 target for advanced in-space propulsion technologies for solar system exploration. This research provides a key component in facilitating exploration missions: a technology that can substantially reduce the cost of undertaking particular types of robotic exploration. Building on the framework of a successful ESA study, our team of leading academics, research institutions and space companies has developed a conceptual design of a very small, yet highly performant electrical propulsion system. The conceptual design is based upon experimental data already obtained by team members. As a result we are confident that this system can provide the transportation element for taking nano/micro satellites to any location in the Earth-Moon system and will even allow missions to nearby planets and asteroids. The propulsion system will thus permit new exploration mission concepts. These missions due to their size will be developed within a fraction of the time for conventional missions. Their simplicity, perhaps even single instrument spacecraft, will reduce risk for carrying out the mission. Overall this will dramatically reduce cost of individual missions, thus providing more flight opportunities for planetary scientists and planetary exploration.

To achieve these goals the propulsion technology has high performance at low mass and low power demand. The propulsion system is a microfabricated colloid thruster having a high degree of subsystem integration. Our work so far has demonstrated the capability of this concept to have a radically reduced part set making substantial progress towards a thruster-on-a-chip. Our experienced team will take the technology through to the significant position of having tested and fully characterized a breadboard model. The design approach is that this is also a proto-flight model such that gaining the final step of a flight test for the hardware is low risk and low development cost.

Fields of science (EuroSciVoc)

natural sciences > physical sciences > astronomy > **space exploration**

engineering and technology > mechanical engineering > vehicle engineering > aerospace engineering > astronautical engineering > **spacecraft**

natural sciences > physical sciences > astronomy > planetary sciences > **asteroids**

engineering and technology > mechanical engineering > vehicle engineering > aerospace engineering > **satellite technology**

natural sciences > physical sciences > condensed matter physics > **soft matter physics**

Programme(s)

FP7-SPACE - Specific Programme "Cooperation": Space

Topic(s)

SPA.2010.2.1-04 - Space transportation for space exploration

Call for proposal

FP7-SPACE-2010-1

[See other projects for this call](#)

Funding Scheme

CP - Collaborative project (generic)

Coordinator

ECOLE POLYTECHNIQUE FEDERALE DE LAUSANNE

EU contribution

€ 480 292,40

Total cost

No data

Address

BATIMENT CE 3316 STATION 1
1015 Lausanne
Switzerland

Region

Schweiz/Suisse/Svizzera > Région lémanique > Vaud

Activity type

Higher or Secondary Education Establishments

Links

Contact the organisation Website
Participation in EU R&I programmes
HORIZON collaboration network

Participants (4)

QUEEN MARY UNIVERSITY OF LONDON

United Kingdom

EU contribution

€ 454 159,60

Address

327 MILE END ROAD
E1 4NS London

Activity type

Higher or Secondary Education Establishments

Links

[Contact the organisation] [Website]
[Participation in EU R&I programmes]
[HORIZON collaboration network]

Total cost

No data

NEDERLANDSE ORGANISATIE VOOR TOEGEPAST NATUURWETENSCHAPPELIJK ONDERZOEK TNO

Netherlands

EU contribution

€ 320 048,50

Address

ANNA VAN BUERENPLEIN 1
2595 DA Den Haag

Activity type

Research Organisations

Links

[Contact the organisation] [Website]
[Participation in EU R&I programmes]
[HORIZON collaboration network]

Total cost

No data

GOMSPACE SWEDEN AB

Sweden

EU contribution

€ 419 660,00

Address

ULLS VAG 29 A
756 51 UPPSALA

Region

Östra Sverige > Östra Mellansverige > Uppsala län

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

[Contact the organisation](#) [Website](#)
[Participation in EU R&I programmes](#)
[HORIZON collaboration network](#)

Total cost

No data

SYSTEMATIC DESIGN BV

Netherlands

EU contribution

€ 318 746,00

Address

ELEKTRONICAWEG 20
2628 XG DELFT

Region

West-Nederland > Zuid-Holland > Delft en Westland

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

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Total cost

No data

Last update: 6 September 2024

Permalink: https://cordis.europa.eu/project/id/263035